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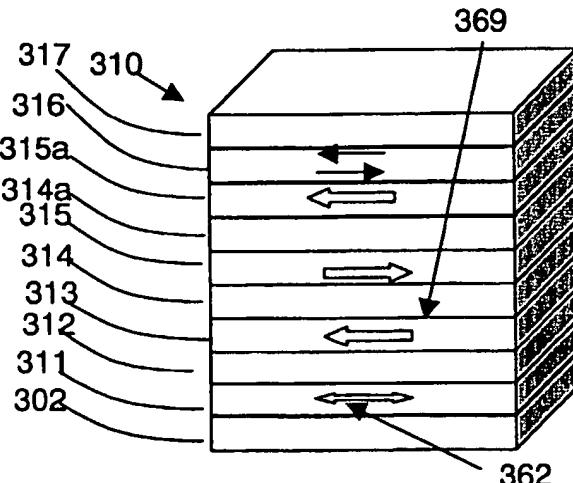
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- (71) Applicant (for all designated States except US): AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH [SG/SG]; 20 Biopolis Way, #07-01 Centros, Singapore 138668 (SG).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): ZHENG, Yuankai [CN/SG]; Apt Blk 24, Teban Gardens Road, #09-168, Singapore 600024 (SG). WU, Yihong [SG/SG]; Blk 10, Dover Rise, #17-09, Singapore 138680 (SG).
- (74) Agent: VIERING, JENTSCHURA & PARTNER; P.O. Box 1088, Rochor Post Office, Rochor Road, Singapore 911833 (SG).
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(54) Title: MAGNETIC MEMORY DEVICE



(57) Abstract: A memory cell (310) for a magnetic memory device (300) includes a free layer (311), a cap layer, an antiferromagnetic layer, and a synthetic antiferromagnetic layer which comprises two or more than two ferromagnetic layers that are antiferromagnetically coupled through non-magnetic space layers. The synthetic antiferromagnetic layer is pinned by antiferromagnetic layer. The antiferromagnetic layer and the synthetic antiferromagnetic layer form a synthetic antiferromagnetic pinned (SAFP) recording layer. The magnetization of the SAFP recording layer can be changed by combining a heating process and an external field induced from currents flowing along the bit line (320) and the word line (330). Therefore, a MRAM with high density, high thermal stability, low power dissipation and high heat tolerance can be achieved after introducing the SAFP recording layer due to the high volume and anisotropy energy of the SAFP recording layer.